

CONTENTS - Beginner`s Guide to Tube Audio Design by Bruce Rozenblit - code 3004

title
CHAPTER 1 - WHAT IS A VACUUM TUBE? First Simplification: Electrons - 3, Second Simplification: Fields and Electron Motion - 3, Tube Parts - 3, Tube as a Heat-Powered Engine - 3, The Space Charge - 4, Tube Construction-The Triode - 4, Basic Tube Parameters - 4, Impedance - 5, Triode Parameters - 5, Biasing - 5, Tube Characteristics - 5, Dynamic Plate Resistance - 6, Transconductance - 6, Amplification Factor - 6, Tube Characteristic Charts - 7, The Pentode - 7, Pentode Characteristics - 8, Tube Capacitance - 8, Tube Specifications - 9, Tube Life - 9.
CHAPTER 2 - SINGLE-STAGE BASICS, Single-Stage Triode Amplifiers - 11, Set the Bias - 11, Gain Stage - 12, Triode Models - 13, Simple Algebra - 13, Adding a Cathode Resistor - 14, Input Impedance - 14, Output Impedance - 15, Circuit, Interfaces - 15, Pentode Models - 16, Summary - 16
CHAPTER 3 - SIMPLE GAIN CIRCUITS, Single-Stage Triodes - 17, Fixing Output Impedance - 17, Essential Parameters - 18, Resistor Values - 18, Getting Sufficient Gain - 18, Single-Stage Pentodes - 19, Compromises - 19, Tweaky Stuff - 20, Negative Feedback - 20
CHAPTER 4 - NEGATIVE FEEDBACK, Nonlinearity - 21, Measuring Time in Degrees - 21, Adding Sine Waves - 21, Feedback Circuits - 22, Passive Networks - 22, Decibels - 23, Phase Change - 23, Benefits of Feedback - 25
CHAPTER 5 - SINGLE STAGE FEEDBACK CIRCUITS Direct-Coupled Cathode Follower - 27, Negative Voltage Feedback - 27, Gain - 28, AC-Coupled Cathode Follower - 28, Feedback in Single-Stage Gain Circuits - 29, External Loop Connection - 29.
CHAPTER 6 - MULTISTAGE BASICS, Amplifier-Circuit Types - 31, Voltage and Power Amplifiers - 31, Preliminary Questions - 31, Parameters - 32, Reducing Distortion - 32, Low-Frequency Instability - 32, High-Frequency Instability - 33, Optimization - 33, Push-Pull Circuits - 33, Continuous Exchange - 34, Balanced Circuitry - 34, High-Frequency Compensation - 34.
CHAPTER 7 - AMPLIFIER PARTS, Phase Splitters - 35, Phase-Splitter Design - 36, Phase-Splitter Variation - 36, Setting Design Parameters - 37, Differential Amplifier - 38, Negative Power Supply - 39, Constant Current Source - 39, Other Constant-Current Source Benefits - 40, Constant-Current Source Outputs - 40, The Cascode - 41, Circuit Model and Equations - 41.
CHAPTER 8 - OUTPUT STAGES AND TRANSFORMERS, Transformers - 43, Electromagnetism - 43, Magnetic Induction - 43, Current Relationship - 44, Impedance Relationship - 44, Internal Impedance - 45, Transformer Windings - 45, Bifilar Windings - 45, Current Flow - 45, Plate Voltage - 46, Modes of Operation - 46, Bias Mechanisms - 46, Single-Ended Operation - 47, Output-Tube Types - 47, Full-Power Rating - 48, Peak Voltage - 48, Impedance and Power Specs - 48, Screen Grids - 48, Triode Operation - 49, Ultralinear Stage - 49, Phase Shift - 49.
CHAPTER 9 - POWER SUPPLIES AND VOLTAGE REGULATORS, Power and Work - 51, Voltage as Potential Energy - 51, Voltage Stability and Regulation - 51, Power-Supply Design - 51, Regulation - 52, Rectification - 52, Full-Wave Bridge - 53, Filter Capacitor - 53, Ripple - 53, Conduction Angle - 53, Reducing Ripple - 54, Filter Choke - 54, Voltage Doubler - 54, Rectifier Characteristics - 55, Vacuum-Tube Rectifiers - 55, Power Transformers - 56, Filament Power Supply - 56, Voltage Regulations - 56, Gas Tubes - 56, Zener Diodes - 57, Series-Pass Regulators - 57, Single-Stage Three-Terminal Regulator - 57.
CHAPTER 10 - STABILITY NETWORKS, Poles - 59, Test Circuit - 59, Checking Input Stability - 59, Open-Loop Stabilization - 60, Low-Frequency Instability - 60, Spacing Poles - 60, Closing the Feedback Loop - 60, Applying Compensation Networks - 61, Checking Phase Relationships - 62, Make Notes - 62, Feedback Concerns: Stability Margin - 62.

CHAPTER 11 - CLASSIC DESIGNS, Learning from the Past - 63, Jefferson 2A3 - 63, Amplifier Sections - 64, Williamson Amplifier - 64, Leak RC/PA/U - 65, Fisher 50-AZ - 67, Grommes 260A - 67, Dynaco Mark III - 69, Heathkit W-6M - 69, McIntosh MC-60 - 69, Marantz Model 5 - 71, Grommes Model 212 - 77, Dynaco PAS-2 - 77.

CHAPTER 12 - PRACTICAL CONSIDERATIONS, Test Equipment - 79, Assembly Procedures - 79, Equipment Tips - 79, Component Placement - 79, Choosing Resistors - 80, Choosing Capacitors - 81, Choosing Tubes - 81, Conclusion - 81.

PROJECTS A Line Level Preamp - 83, A Transformerless Output Amplifier - 88, Test Bench Power Supply - 95.

BIBLIOGRAPHY - 100

INDEX - 102